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User Discretion Advised: Fiscal Consolidation and the Recovery

When the central bank's options are limited by very low interest rates, what role should fiscal policy play in spurring economic recovery? For the federal and Ontario governments, the answers are very different.

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The Study In Brief

Since the financial crisis in 2008, controversy has existed over whether governments should use fiscal policy in an attempt to stimulate economic activity, or whether fiscal consolidation is preferred. Those who call for continued stimulation focus on how slow and incompletely shared our recovery has been, while those favouring austerity argue that postponement of deficit and debt reduction retards business expansion, thereby hurting the recovery. This study evaluates the many strands of this fiscal policy debate, and applies the lessons to the decisions currently facing the federal and Ontario governments.

The main conclusions are:

- In normal times, fiscal policy should focus on allocation and distribution questions – public good provision, support for those on low incomes, and debt control – and should not focus on the short-run cycles in economic activity. Cyclical problems are normally best addressed by relying on monetary policy to strengthen the economy's self-correction mechanism.
- In non-normal times – involving very low interest rates and synchronized recessions across countries – monetary policy is relatively ineffective and fiscal policy is decidedly more effective than usual. This situation – precisely what we have been confronting since 2008 – is the exception to the general rule. In this case, fiscal policy should take an active part in stabilization initiatives.
- The federal government should delay its final stage of deficit reduction by three years. If its deficit-to-GDP ratio is held at one-half of one percentage point for three years before reducing it to zero, it is estimated that the nation's unemployment rate would be four-tenths of one percentage point lower during this three-year period. This opportunity to help working Canadians should not be passed up – especially when the cost in terms of reaching the government's stated debt-ratio target of 25 percent by 2021 is so small – a missing of that target by just one percentage point.
- The federal government's deficit and debt targets are internally inconsistent. A debt-ratio target of 25 percent – along with an ongoing nominal GDP growth rate of 4 percent – requires a permanent deficit ratio of 1 percent, not zero. The government could achieve internal consistency by eventually lowering its debt target to zero. However, achieving consistency by raising its deficit target back up to 1 percent makes more sense when there are other short-term-pain-for-long-term-gain initiatives that are needed to address more pressing objectives than lowering a debt ratio that is already the envy of the world.
- The Ontario government should address its long-term sustainability challenge before it embarks on major new expenditures. Policy-created uncertainty cannot be overcome when the government's plans involve an increase in the deficit before it may start to decline. Infrastructure investments are particularly appealing when borrowing costs are low, but credibility requires that these debt service costs be covered by well-identified reductions in the operating expenses associated with existing government programs.

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Should fiscal policy be used in an attempt to stabilize the economy? For some, the answer to this central question is "obviously yes," since it is desirable to reduce unemployment that has emerged during a recession.

For others, the answer is "no"; they argue that only tiny reductions in unemployment can be expected from such expansionary policy, and that the higher government debt that must accompany the attempt to lower unemployment will decrease the government's ability to pursue other worthwhile objectives in the ensuing years. According to this view, austerity – in the form of fiscal consolidation, with its anticipated favourable effect on business confidence – not expansionary fiscal policy is what is needed today. This study reaches a mixed verdict on this question. After examining general principles and then applying them to Canada, I conclude that a more gradual fiscal consolidation is warranted at the federal government level, but not at the provincial government level.

The study is organized as follows. The next section provides perspective by tracing the historical evolution of views on this topic. Then, in section 3, I ask whether it is necessary to use fiscal policy to pursue stabilization when we have a modern central bank committed to a price-stability target. I conclude that fiscal policy is not generally needed, but it can become so when the central bank is constrained by the zero lower bound on nominal interest rates; i.e., they are at or near zero. In section 4, I focus on whether there are similar situations that limit the effectiveness of fiscal policy as well. I conclude that there are several such important constraints, but they can be expected to be of least importance in precisely the circumstance when monetary policy is least reliable. Taken together, the analyses in these two sections suggest that – in broad outline – the expansionary fiscal policy of the last several years in Canada has been appropriate.

Then, in section 5, I address the question whether Canada is still in the situation that supports fiscal stimulus. I illustrate – in numerical terms – the trade-off involved if the federal government delays slightly its fiscal consolidation. I consider how much of a delay in debt reduction will have to be incurred to have a specified reduction in the unemployment rate over the next few years. My conclusion is that the payoff of a slightly delayed fiscal consolidation at the federal level clearly exceeds the cost.

Finally, in section 6, I focus on provincial fiscal policy, in particular that of Ontario. In this case, I conclude that delayed attention to reducing the budget deficit is a risky strategy which undermines, among other things, the government's own goal of addressing other challenges such as the infrastructure deficit.

Following the concluding section of the essay, there is an appendix which addresses, at a more

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technical level, an assumption which underpins the entire study – that we face a trade-off. We consider the hope expressed by some that fiscal policy involves a "free lunch" – that government policy initiatives might be self-financing, both in the short and long run, so that expansionary fiscal policy might not raise government debt at all.

2. The Evolution of Views on Stabilization Policy

For classical economists, writing before the depression of the 1930s, using fiscal policy for stabilization did not arise as an issue. After all, Canada had no income tax before World War I, and our governments were much smaller than today, constituting only 10 percent of the GDP in 1929. Of course, there were business cycles, but the classical economists believed that no response from government was required since they believed that the economy possessed a self-correction mechanism. In a recession, for example, workers and firms have an incentive to lower wages and prices, so that the demand for their goods and services is automatically stimulated in a downturn.

This self-correction process was never expected to operate quickly or smoothly, since there is always a temptation for economic actors to "wait it out," hoping that a cut in wages or prices may not be necessary. This downward rigidity in wages and prices meant that recessions would often dissipate more slowly than many would like to see.

For many economists and policymakers, the depression in the 1930s shook their confidence in this "hands off" approach to business cycles. Some have argued that this loss of faith was not appropriate, since the 1930s period was very much worse than it had to be because of bad monetary policy. In the United States, the central bank failed to act as the "lender of last resort" as it was supposed to, and as a result fully one-third of commercial banks failed in the 1929-to-1933 period. This represented a dramatically contractionary monetary policy occurring at the worst possible time. So, while some commentators have argued that with a properly supportive central bank there is no need to give up on an otherwise laissez faire attitude to business cycles, the majority shifted to favouring direct government involvement to promote stability. This shift in opinion was accelerated by the publication of Keynes' *General Theory* in 1936, in which it was argued that reliance on monetary policy was ill-advised, and that active fiscal policy was required.

Keynes did not ignore government debt, so he would be surprised by the fact that many resist his advice today on the grounds that debt control – and the associated policy of austerity even in the face of serious recessions – must be the primary concern. His advice was that the government should balance the budget, but that it should choose a sensible time frame over which to do so. Rather than balancing every one year, or indeed over any other arbitrary time interval of (say) 17 seconds, the government should balance the budget over the time frame of one full business cycle: running a deficit during the recession half (to prop up spending) and running a surplus during the overheated half (to dampen spending and the bring the debt back down).

The running deficits half of the Keynesian strategy was quickly implemented, but with both the prolonged depression of the 1930s and then World War II, Western governments did not get on to the running surpluses half until after 1945. As a result, the Canadian federal government debt-to-GDP ratio rose from the pre-depression level of 45 percent to the post-WWII level of 110 percent. But thereafter, the other half of the Keynesian advice was implemented (in an era of particularly rapid economic growth which fortuitously helped increase the denominator of the debt ratio) and by the early 1970s our federal debt ratio was down below 25 percent. In retrospect, fiscal policy during this 40-year period has not been judged irresponsible. After all, the government had helped to smooth Canadians' living standards from major one-time events such as the depression and the war. Allowing variation in the debt of an institution that

lives forever – over a long period of time when two generations of Canadians do not coexist – allows those generations to make (otherwise impossible) transfers from one to the other. In this particular case, the later generation received the benefit of freedom and economic growth, while paying in the form of having to service and reduce the accumulated debt.

Despite this success, support for the Keynesian strategy dissipated over the quarter century following 1970. During that period, the federal government ran a deficit every year. It was simply not possible to argue that we had a recession that entire time, or that there was some fundamental structural change that might justify a series of deficits. So the Keynesian approach became discredited by its misapplication during that time. There was no justification for the 50-percentage-point increase in the federal debt-to- GDP ratio, and so it became widely accepted that fiscal policy should focus on long-run questions of public-good provision, income redistribution and debt control, and have no focus at all on short-run stabilization.

It was not just the misapplication of fiscal policy that led to its downfall as a candidate for stabilization policy. There were two other important developments. First, people started to realize that, when the government commits to maintaining high and stable employment, the economy's self-correction mechanism can be weakened. The standard incentive for workers to moderate wage demands, and for firms to moderate price increases, is the knowledge that there is a negatively sloped demand curve for their services and products. But if the government is committed to shifting those demand curves to the right by whatever it takes to preclude any fall in employment or sales, that incentive for moderation diminishes. Thus, the government faces a vicious circle – the resistance to wage/price cuts justifies intervention, which solidifies that very wage/price inflexibility and so calls for ever-more intervention. To extricate the government from this situation, it was once thought that the commitment to full employment should become less explicit. Instead, it came to be accepted that lower cyclical unemployment should be a beneficial indirect benefit that could be expected from a central bank rigorously pursuing a price stability target. Since we did not suffer a major contraction in demand for quite a few years, the zero lower bound on nominal interest rates was not a binding constraint on the central bank for the first 20 years of our experience with inflation targeting. Thus, it is, not surprising that this handing over of stabilization policy to the central bank has been a success.

The second development that undermined the enthusiasm for focusing fiscal policy on short-run stabilization was that a number of influential theoretical and applied studies emerged (reviewed in the section 4 below) which fundamentally questioned the ability of fiscal policy to make any appreciable difference to aggregate demand. In the next several sections of the essay, I expand on each of these developments that have been briefly noted in this historical overview.

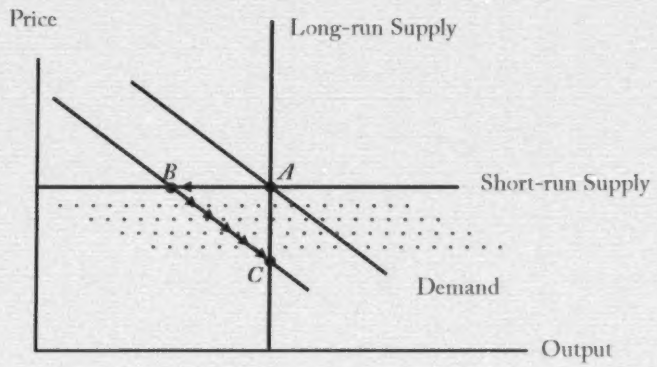
3: In Normal Times Fiscal Policy Is Not Needed for Stabilization

Macroeconomic reasoning is most easily appreciated by focusing on three relationships that describe the determinants of overall demand, monetary policy and price-setting by firms. I discuss each in turn.

Overall Demand

The quantity of goods demanded in the current period depends positively on the level of government program spending and other autonomous expenditures, and on expected future inflation. Current demand depends negatively on borrowing costs (the real interest rate), taxes, the current domestic price level, and the international value of the domestic currency. Graphically, I show the inverse dependence of demand on the current price

Figure 1: Aggregate Demand and Supply



Source: Author.

by drawing a negatively sloped curve (with price on the vertical axis and the quantity of goods on the horizontal axis) as in Figure 1. The influence of all other determinants of demand is illustrated by shifting the position of that negatively sloped line in the appropriate direction (for example, higher government spending, or a lower domestic currency value which increases exports, shifts the demand curve to the right).

Monetary Policy

I consider monetary policy as an interest-rate setting relationship: the nominal interest rate is adjusted upward (to a level that is above its long-run average value) whenever the price level exceeds the central bank's target value (and below its average value when the price level is below target). For simplicity in this essay, I focus on price-level (as opposed to inflation-rate) targeting.[1] An implication of this simplification is that recessions involve deflation, not just disinflation. It is reassuring that the conclusions of the analysis are unaffected by this simplification. In any event, it is sometimes the case that the monetary policy reaction function can get overridden by the zero lower bound on nominal interest rates. In this situation, when the monetary authority wants to stimulate demand and expand the economy, it cannot do so by ordinary measures since, without charging banks a fee for holding reserves, it is impossible for it to lower the short-term nominal interest rate below zero, and it is difficult to charge banks additional fees at precisely the time when there is concern about banks failing.

1 Regarding the difference, Ambler (2014, 3) notes: "Under inflation targeting, inflation is gradually brought back to its target rate after a positive inflation shock, leaving the price level to follow a permanently higher path. Under price-level targeting, inflation is temporarily brought below the target rate, and the price level gradually returns to its initial target."

Price Adjustments

Price adjustments occur gradually. Positive inflation (in excess of expectations) occurs when the current level of output exceeds the economy's long-run sustainable level. Symmetrically, unexpected deflation occurs when the current level of output falls short of its long-run sustainable level. In honour of the economist who first documented this association in the data, it is called the "Phillips" relationship.

Figure 1 illustrates how this reasoning helps us understand how a recession can develop and how, in general, we can expect that it will dissipate without fiscal intervention. Assume that – initially – the economy is observed at point A, and then one component of demand (say exports) drops permanently. The demand curve shifts left, and since prices are sticky in the short run, the observation point moves to B. This drop in real GDP is the recession. Then, prices start to fall and the economy gradually moves from point B to point C. This is the recovery period. Eventually, the initial level of real output is restored, and it is the price level, not the level of output and employment, that takes the hit. This automatic return of the economy to its long-run sustainable level of output is its self-correction mechanism.

Possible Snags in the Self-Correction Process

There are two complications that can undermine this otherwise reassuring process. First, deflationary expectations can set in. Households and firms understand that prices will be falling throughout the B-to-C adjustment period. They may decide to cut back current spending and wait to buy when the prices are lower later on. If they do react in this way, the demand curve shifts further to the left as the observation point is moving down it. As a result, it is possible that the observation point could move in the southwest, not the southeast, direction with the result that the recession would get progressively worse. This is why today's central bankers have been so concerned about deflation; they do not want such a self-fulfilling ever-worsening recession scenario to develop. There is another possible snag in the self-correction process, and it concerns the slope of the demand curve. If this curve is very steep, even if it does not shift further to the left at all, the B-to-C time path could involve prices falling dramatically (even to zero) without the full-employment level of output being restored. Is there any reason to believe that such a steep demand curve is relevant in the actual economy?

There are three reasons why the demand curve usually has a negative slope. First, as our prices fall, and the prices in others countries do not, then our firms become more competitive and the demand for Canadian products rises. Thus, as long as we have a recession and most of our trading partners do not, our demand curve will be negatively sloped. But if essentially all countries suffer a recession at the same time, all prices will be falling with the result that no country's relative price will be declining. In this synchronized recession environment, then, this source of the negative slope for our demand curve disappears, so the demand curve becomes steeper. Usually recessions are not synchronized, but they were in the 1930s and in 2008-2009. So this consideration is relevant from time to time.

The second source of the demand curve's negative slope is the central bank. As prices fall, the monetary authority usually lowers interest rates, and this stimulates demand. But if the zero lower bound has been reached, the interest rate cannot be lowered, so demand is not stimulated as price falls. It is worth noting the periods when the zero lower bound has been important: in the United States in the 1930s and in recent years, and in Japan since 1990. In all three cases, the recessions lingered for a very long time. This evidence is consistent with the model's suggestion that the demand curve may well be discouragingly steep when interest rates are very low. This is why today's central banks have been so concerned to adopt "novel" monetary policies. They know that if they are not successful, the demand

curve may well remain too steep for the self-correction mechanism to work.

The third reason why some economists think that the demand curve may have the desired negative slope – even when recessions are synchronized and when the zero bound on nominal interest rates is binding – is that falling prices raise the real value of wealth that is based in nominal terms. For example, falling prices raise the real value of cash holdings and government bonds, and this increase in wealth may increase peoples' spending. This was Pigou's (1943) answer to what Keynes called a liquidity trap (his name for the zero lower bound problem). But Pigou's consideration is dominated by Irving Fisher's (1933) analysis, which pointed out that deflation raises the real value of people's nominal debts as well, so for this subset of the population falling prices mean less ability to purchase goods.

We now know that borrowers react one-for-one with variations in their current disposable income, since they get into debt by having a propensity to consume that approaches unity. Many lenders, on the other hand, set their spending according to their long-run average income (letting variations in saving absorb cyclical variations in their current income). In other words, many lenders have a propensity to consume that applies to current income that is very much less than unity. As a result, the Fisher effect dominates the Pigou effect, so that falling prices lead to lower, not higher spending, and if anything, this line of argument contributes toward the demand curve being positively, not negatively, sloped. So the overall conclusion is that, while the steep-demand-curve issue is not usually a concern, there are times – such as in recent years – when it is a relevant issue.

Enter Quantitative Easing

As noted, central bankers appear to accept this verdict. Otherwise, why have they been devoting such attention to "novel" monetary policies: quantitative easing and forward guidance? In the main, quantitative easing is really a pair of initiatives undertaken simultaneously. First, new money is issued to buy short-term government bonds (standard monetary policy), and second, the short-term bonds are exchanged for long-term government bonds with the intent of reducing the latter's yields. This second half of the package is simply a repeat of earlier policy experiments known as "operation twist" in the United States (1961) and as the "conversion loan" episode in Canada (1958), which involved our governments trying to affect the slope of the yield curve by changing the relative supplies of bonds with different terms to maturity. Significant effects on the term structure of interest rates were hard to find in both episodes (Pesando 1975).

As a result, it is difficult to see how the supposedly new quantitative easing policy can do much to lower long-term interest rates (the ones that have not been right at the zero lower bound). Of course, another dimension of quantitative easing involves the central bank purchasing privately issued securities, of any term to maturity. This policy can help avoid bankruptcies of particular firms, but such initiatives are really money-financed fiscal bail-outs.

Forward Guidance

Forward guidance involves the monetary authority promising to keep short-term rates low for longer than the central bank would normally do, after the recovery is well underway. The point is to get people to expect some inflation, since with the bank having promised not to fight that inflation with its usual vigour, it is hoped that expected inflation will set in and stimulate people to buy now to "beat the coming price increases." But there is a dynamic consistency problem with this announcement. There is no way the central bank can commit now not to renege on its promised inflation later. It will be tempting for the bank to renege, since – with our inability to revisit the past – people cannot go back and lower their previous inflationary expectations. The fact that this temptation is present lowers the

credibility of the initial promise. This is especially the case given the manner in which forward guidance was practiced in Canada, where the promise was explicitly "conditional" on the bank not finding any reason for a reassessment.

The US Federal Reserve has tried to lessen this credibility problem by announcing a target unemployment rate in advance. To assess this innovation, consider a situation in which the unemployment rate falls faster than was anticipated. If the central bank's initial commitment was to keep the interest rate low until the unemployment rate falls below a pre-announced level, then there would be no credibility problem if it increases the interest rate – perhaps earlier than some anticipated – when this critical unemployment rate is reached. But there is also a reduced incentive for people to adopt high inflationary expectations in the first place – and the creation of these expectations is the entire purpose of embracing forward guidance.

It has been shown that the credibility issue can be less of a problem if the central bank targets the price level, not the inflation rate. (See, for example, Ambler 2014.) Nevertheless, especially since few central banks have shifted to price-level targeting, it seems prudent to consider the use of fiscal policy in the one situation that we have identified as a problem for both self-correction and monetary policy – synchronized recessions that involve the zero lower bound on interest rates. This view is shared by many (for example, Mankiw (2002), Blinder (2006) and DeLong and Summers (2012)), and it has recently received additional support from the New Neoclassical Synthesis in macroeconomics, which combines the rigour that follows from embracing explicit micro-foundations (as demanded by New Classicals) with a well-identified source of market failure (the hallmark of the Keynesian tradition).[2]

The present section of the essay has stressed that, normally, we should think of the economy operating within what Leijonhufvud (1973) has called its "stability corridor." As long as the economy is buffeted by shocks that are not large enough to lower output to the point that either the steep-demand-curve or the destabilizing-expected-deflation problems becomes relevant, we can count on the self-correction mechanism. Capitalism does not need to be rescued by an active fiscal policy. But we should also acknowledge that sometimes shocks are large, and that there is a widely acknowledged situation wherein the self-correction mechanism – even aided by monetary policy – can break down, when the economy is pushed outside of its stability corridor (as we were in 2008). But are there situations when the efficacy of aggregate-demand management via fiscal policy breaks down as well? The answer is "yes," and to provide balance we focus on identifying these problems in the next section.

4. In Normal Times Fiscal Policy Is Not Helpful for Stabilization

The rationale for expansionary fiscal policy is this: increased government spending on programs and infrastructure can add to total spending, when private demand on the part of households, firms and foreigners is lagging. But it is possible that the increased government spending may lead to reductions in these private demands so that the policy may just replace pre-existing private spending rather than add to it. This possibility is called the "crowding out" effect, and we consider two avenues through which it can operate in this section.

2 For this modern analysis of monetary vs. fiscal policy, see Mankiw and Wienzierl (2011), Eggersston (2011), and Taylor (2000).

The "Crowding Out" Effect

Higher government spending can lead to higher interest rates. For one thing, deficits require issuing bonds and, to ensure that the bonds are purchased, the government may need to offer a higher yield. In addition, the response of the central bank is important. If the bank pursues price stability, and it believes in the Phillips relationship, it knows that to meet its price stability target it must set policy to deliver the appropriate output gap.[3]

If fiscal policy shrinks that output gap, the bank must widen it again. It does so by raising interest rates to depress private spending by the requisite amount. Because the bank gets to "play last," it effectively overrides the intent of the fiscal policy. Of course central banks were not always focused on price stability, and so it is reassuring (from the point of view of confirming the model's predictions) that the estimated size of the effects of government policy has been systematically shrinking as more recent data is involved in the estimations – that is, as central banks have ever more aggressively targeted price stability (Mankiw and Scarth 2011, 349-51). But in a zero-interest-rate recession, no central bank wants to raise interest rates, so this (normally very important) avenue for crowding out is not relevant in this case.

In small open economies, the crowding out effect operates more through the exchange rate than through interest rates. International financial capital is extremely mobile today, and the result is that it is difficult for there to be a lasting difference between the interest rates that prevail in two countries that are perceived to be in the same risk category. In Canada's case, this means that – except when major exchange-rate changes are expected, such as when there was a significant concern about Quebec separation – our interest rates return to the level of comparable yields in the United States after anything happens to generate a temporary interest rate differential. This is important for fiscal policy.

As already noted, an increased level of government spending has an initial effect of raising the domestic interest rate. This temporary excess of the Canadian yield above the American yield induces wealth holders to send funds into Canada to purchase the higher yielding securities. This inflow of funds is large and immediate since market participants recognize that this is a fleeting opportunity. The inflow bids up the value of the Canadian dollar, which makes it harder for our exporters to sell their goods, and it induces Canadians to increase imports. These effects pull demand back down.[4] The result is that the foreign demand for domestically produced goods goes down by essentially the same amount that the government's demand went up, since only then is the pressure for higher domestic interest rates relieved. As a result, just as Mundell (1963) and Fleming (1962) wrote long ago, fiscal policy has no lasting effect on aggregate demand under flexible exchange rates.

There are two exceptions to this general rule. First, funds will not be induced to flow into the country if all our trading partners are performing a similar fiscal policy at the same time (since both domestic and foreign interest rates rise). Second, there will be no rise in interest rates if the zero

3 That is, the appropriate difference between actual GDP and the long-run sustainable level of GDP (often referred to as potential GDP).

4 There are competing effects; for example, with imported investment goods becoming cheaper, domestic investment spending can increase. But more advanced analyses, which allow for both intermediate imports and supply-side effects of exchange rates (Scarth 2014, 162-167), support the conclusion in the text.

lower bound constraint is binding; i.e., effectively in force. In these situations, there is no pressure for the exchange rate to change. Thus, while we may be nominally following a flexible exchange rate policy, it is as if we are fixing the exchange rate. There is no crowding-out effect in this situation. Perfect capital mobility precludes interest-rate-induced crowding out, while the unchanging exchange rate precludes the open-economy avenue for crowding out. Since Canada has encountered both of these situations in recent years – similar fiscal policies being pursued abroad and the zero lower bound constraint on nominal interest rates – this period has been the very (and only) time when we can expect fiscal policy to matter for demand management.

What about the "Multiplier" Effect?

Keynes labeled the ratio of the overall increase in output that follows from an increase in government spending – divided by the increase in government spending itself – the "multiplier." When the earliest simple models that excluded any crowding out effects were estimated empirically, multiplier estimates in the four or five range emerged, so that Keynes' "multiplier" terminology seemed quite appropriate. But as already noted, when estimation carefully allows for both crowding out effects and forward-looking expectations (which magnify the short-run relevance of the interest rate and exchange rate effects) the revised estimates are much lower (Mankiw and Scarth 2011, 349-51, Blinder 2006 and DeLong and Summers 2012). If the zero lower bound is not binding on interest rates, multiplier estimates are below one, so that – while increased government spending is somewhat expansionary (the multiplier exceeds zero) – the term "multiplier" ceases to be appealing since that terminology suggests a factor that exceeds unity. But without the zero lower bound or a fixed exchange rate, the evidence simply does not support a belief that the multiplier is above one.

However, in the special case in which we have found ourselves in the last few years, we can expect a larger multiplier. Indeed, the recent estimates for the multiplier are in the two-to-three range. Several New Neoclassical Synthesis studies support this conclusion, including Eggersston (2010), Woodford (2011), Christiano and Eichenbaum (2012), Fernández-Villaverde et al. (2012), and Rendahly (2012). There are some skeptics in this literature (for example, Braun et al. (2012) and Mertens and Ravn (2012), and it is because of this controversy that I opt for a modest value for the multiplier below.

DeLong and Summers argue that reasonable people will restrict their debate on this question – for a large economy such as the United States that is less exposed to exchange-rate crowding out – to a multiplier range between 0.5 and 2.5. Since we should expect a smaller multiplier estimate for a small open economy such as Canada, I focus on a value of 1.5 in my numerical analysis in the next section of the essay – recognizing that even this relatively modest multiplier estimate will increasingly have to be regarded as "too high" as the recovery proceeds.

Difficult-to-Measure Issues

The empirical work that has generated these multiplier estimates cannot fully incorporate certain difficult-to-measure issues. But these can be important considerations. For one thing, several expectations effects have been stressed in the literature. On the "crowding out" side, some argue that higher government spending leads firms to expect higher taxes in the future, with the result that investment projects are shelved. In these models, investment spending can fall by more than the government spending increases, so the "multiplier" is negative. This implies that fiscal consolidation can be expansionary, not contractionary. But Perotti (2011) argues that only a few countries appear to provide evidence in favour of this expansionary-consolidation hypothesis, and on closer inspection, the large currency depreciations that most experienced at the same time seem to account for the boom that was observed.

Nickel and Tudyka (2013) provide some counter evidence, but only for countries whose government debt-to-GDP ratio exceeds 60 percent. Overall, then, there is limited evidence to support the expansionary-consolidation hypothesis. On the "crowding in" side of the debate, some have argued that firms' investment spending is higher when volatility is lower, so if fiscal policy can deliver lower variance in GDP, investment may be higher even with some fear of higher taxes in the future. Further, if the government spending is truly focused on infrastructure, firms' costs could be reduced and this could stimulate investment.

Some recent work shows that it is particularly unappealing for the government to create uncertainty about what its ongoing policy will be. Fernandez-Villaverde et al. (2013) and Bakera et al. (2013) show that aggregate demand is significantly reduced by policy-created uncertainty. As a result, a fiscal policy that might, in normal circumstances, be expansionary will not likely deliver its modest estimated effects if it emerges from an environment where policy reversals are feared.

Perhaps the most important, if the most difficult to examine empirically, expectations issue is often called the "confidence" effect. If there is widespread fear that a recession could cumulate into a serious depression, many households and firms will follow the individually prudent course of cutting spending. If such precautionary saving rises dramatically, there is a very large drop in aggregate demand. As long as the government insists that it will do whatever it takes to make such fears groundless, and as long as people believe that commitment and that the government has the power to accomplish its objective, then such a bulge in precautionary saving can be avoided. As emphasized in Scarth (2010), there are numerous multiple-equilibria macro models that are fully consistent with the standards of modern macroeconomics (based on explicit optimizing behaviour and rational expectations) and that support this favourable announcement effect of policy (shifting the economy from a "bad" equilibrium – a collapse – to a "good" one). Indeed, the real contribution of the "novel" monetary policies undertaken in recent years may stem from their having this possible confidence-building effect. But there is no reason within the logic of these multiple-equilibria models that should lead us to expect that monetary policy can, while fiscal policy cannot, be used to pursue this possibility. It was widely feared that households and firms simply would not spend significantly in 2008, so there was a need for the fiscal authority to act as the "spender of last resort."

Independent of confidence effects, there is a dynamic consideration that supports economists' preference for relying on monetary policy for stabilization. It has long been thought that raising or lowering the interest rate does not leave the policymaker with anything to "tidy up" later on. There is now some doubt about this, as we have come to at least partially appreciate some of the institutional changes that emerge after (say) a prolonged period of low interest rates. For example, as discussed by Masson (2013), people take on more risk and debt, housing markets experience bubbles, insurance companies and pension funds can become insolvent. Such developments can deepen recessions and weaken recoveries, but they are rarely featured in the standard macro models that are used to inform monetary and fiscal policy debates. It is the case, however, that similar unwelcome legacies of expansionary fiscal initiatives are stressed in the mainstream literature, and this is one of the reasons why fiscal policy has been relegated to the "use only if absolutely necessary" category.

One legacy of a temporary fiscal expansion is that it can be politically difficult to cut program spending back after it has been expanded. But even if this challenge is met, there is a second tidy-up problem for fiscal policy and it concerns the accumulation of government debt while the government runs a deficit during a recession. The government lessens the magnitude of that initial recession, but then – as the debt needs to be worked down later on – fiscal policy is not as expansionary as it otherwise could be and this slows down the

recovery. So there is both a benefit and a cost: a smaller initial recession but a slower recovery. Scarth (2010) shows that these competing effects largely cancel out, leaving the economy not much better off by following the Keynesian approach of running temporary deficits and surpluses over the cycle rather than imposing a strict balance-the-budget-at-all-times rule.

Supportive evidence is available in an extensive OECD study (2009), which finds that only 25 percent of the volatility in real output is removed by allowing the fiscal built-in stabilizers to operate. The take-away is straightforward. In usual circumstances, the benefit of using fiscal policy to pursue stabilization is likely not worth the cost. The reduction of the output loss in the early stage of a recession is roughly balanced by the accentuated output loss while the accumulated debt is reduced later on. But the benefit is bigger and the cost is smaller if (i) the expansionary fiscal policy is pursued in a zero-lower bound, synchronous-recession environment such as that we have been experiencing during the last several years, and (ii) the debt ratio is worked back down after the zero lower bound is no longer binding. In the following section of the paper I illustrate these benefits and costs, so that the heretofore general discussion can be applied directly to our current policy choices.

5. Should the Federal Government Delay Fiscal Consolidation Because of the Slow Recovery?

Two government budget identities are explained in Box A. In the first, the government budget deficit is defined as the excess of program spending plus interest payments on the debt over taxes collected. In the second, each year's increase in the debt is defined to equal that year's deficit. I have used these two relationships to simulate two alternative policies (scenarios) for the federal government.

Scenario One

I assume realistic starting values: a debt ratio (to GDP) of 33 percent, a tax ratio of 14.1 percent and a program spending ratio of 13.6 percent. In addition, I assume 4.5 percent and 4 percent for the nominal interest rate and nominal GDP growth rates to be used in the future projections. When these assumptions are inserted into the equations, realistic values of 1.5 percent and 1 percent emerge as starting values for the ratio of interest payments to GDP and for the overall deficit ratio.

The first scenario shows what might be deemed a neutral plan – to reduce the deficit to zero by the end of the current fiscal year and to leave it at zero thereafter. This scenario is consistent with the government's plan as laid out in the 2014 budget for the first year only. After that, the government has scheduled an overall surplus of roughly one-half of one percentage point of GDP for the next several years. But it is widely expected that the government will use up this "room in the budget" to finance several tax cuts that will be announced during the 2015 federal election campaign. If this happens, these projected surpluses will not materialize, and my simulation will be an accurate illustration of what might emerge. In any event, my two scenarios indicate what the trade-off will be – in terms of higher unemployment in exchange for lower debt – as the government makes this choice.

My baseline simulation indicates that the debt ratio will reach 25 percent in 2021 which is exactly the target, and the target date, the federal government reiterated (in September 2013) is its goal. In this discussion of the results, I am assuming that it is the program spending ratio that is determined residually by the equations to achieve this outcome in the simulations. But I could just as easily be discussing variations in the tax-expenditure-to-GDP ratio, or in the tax-to-GDP ratio instead; the simulations are unaffected. In any event, the average value of what I am calling the program spending ratio over the seven years of the simulation is 13 percent.

Scenario Two

The second scenario involves a delay in fiscal consolidation. Instead of lowering the overall deficit-to-GDP ratio to zero in one year, the government runs a deficit ratio of one-half of one percent for three years, and then cuts all the way to a balanced budget thereafter. As we would expect, the debt ratio target is missed, but only by a very small amount. It reaches 26 percent instead of 25 percent in 2021. Also, as we would expect, program spending is higher during the first three years, by one-half of one percentage point in each of those years. But by the end of the seven-year period, the average program spending ratio is the same as in the first scenario – 13 percent. So very little seems to be lost in postponing slightly the move to a balanced budget.

What is the likely benefit of the higher program spending ratio for the first three years? At today's GDP, one-half of one percentage point is about $10 billion. With a multiplier of 1.5 (still credible at this time since – so far – the recovery has been primarily enjoyed by only those at the upper end of the income distribution), the associated increase in real GDP is an estimated $15 billion, or about eight-tenths of one percentage point.

We can use "Okun's Law" (1962), which Mankiw and Scarth (2011, 42) indicate is still an applicable rule of thumb, to translate this GDP increase into an estimated reduction in the unemployment rate. This empirical regularity indicates that a one-percentage-point closing of the GDP gap is usually associated with about a one-half of a percentage-point reduction in the unemployment rate. (There is not a one-to-one connection between these two measures of excess capacity due to such things as the discouraged worker effect.) Overall, then, we could expect the unemployment rate to be about four-tenths of one percentage point lower for three years if the federal government opts for this slight slowing down of its fiscal consolidation schedule. A government that emphasizes its commitment to protect the interests of working Canadians should not reject this opportunity to lower unemployment when it can be achieved without a serious trade-off.

It could be argued that it may already be too late to pursue this three-year improvement in unemployment. First, the economy is picking up, so the window during which the 1.5 multiplier value is relevant is shrinking. But since growth continues to be below forecasts, there is still time to embrace this opportunity. Second, the latest Fiscal Monitor indicates that the deficit for fiscal 2013-14 is lower than what the government expected in the February Budget. But the current deficit ratio is still estimated to exceed one-half of one percentage point of GDP, so it is still possible for the government to postpone the remaining deficit elimination by one-half of one percentage point for three years, or to refuse to do so. Since the starting point for both scenarios can be changed, while keeping the difference between them unaltered, the government still faces the same choice, and the same estimated benefits and costs of the slight delay in fiscal consolidation.

I have already noted that complete elimination of the deficit before the next federal election is a high government priority. Further, the government has committed never to return to deficit budgets again. So is the slower fiscal consolidation suggestion a non-starter on political grounds? It should not be, because at some point the government will have to acknowledge the logical inconsistency between its zero-deficit goal and its stated debt-ratio target. When that target of 25 percent is reached, and the debt ratio stays constant thereafter, the second government budget identity (see Box A), along with a long-run nominal growth rate of 4 percent, implies that the deficit ratio has to be positive (equal to 1 percent of GDP). In other words, with a reasonable assumption concerning long-term growth, it is logically impossible for the government to maintain its debt-ratio goal without running deficits every year. And even at today's GDP that deficit would be $20 billion annually. So, without adopting a smaller debt-ratio target, the government will eventually have to push the deficit

Box A: Government Budget Identities

Both the simulations of federal government policy options reported in section 5, and the fiscal policy sustainability assessment reported in section 6, are based on two government budget identities:

$$d = (g - t) + rb$$

$$\Delta b = d - nb$$

The notation is defined as follows: d, b, g and t denote the government deficit, debt, program spending, and taxes (measured as proportions of GDP), and r and n denote the interest rate and GDP growth rate. The first equation states that the deficit is the excess of spending on programs (g) and interest payments on the existing debt (rb) over taxes collected (t). The second equation states that the debt ratio rises whenever the growth of the numerator (which is equal to the current deficit – the current increase in the debt) exceeds the growth of the denominator (the GDP growth rate). d and $(g - t)$ are referred to as the overall deficit and the primary deficit.

In section 5, I insert realistic values for the interest, growth and tax rates, along with an assumed sequence of overall deficit values chosen for each policy option, and use the two equations to generate outcomes for the debt ratio and the program spending rate. In section 6, I rely on the fact that the Parliamentary Budget Office uses these same relationships, and defines fiscal policy to be sustainable if the current primary deficit, $(g - t)$, is no larger than what is necessary for the debt ratio, b, to be at its current value in 75 years.

ratio back up. At least some readers are likely to find it unappealing to reject the chance of having a worthwhile effect on unemployment during our slow recovery, when the only price appears to be a trivial slowing down in reaching our debt-ratio target, and when the deficit ratio that will have to be raised again eventually in any event.

Of course, one could argue that a lower debt-ratio target is warranted; for example, 10 years ago I suggested a target in the 20-25 percent range (Scarth 2004). Certainly, the government could lower its debt-ratio target to zero in the coming years. But there are other government initiatives that, like debt reduction, involve short-term pain for long-term gain. Since there is limited political tolerance for such initiatives at any point in time, and since I now regard some of these other initiatives (such as slowing our rate of using up non-renewable resources, and addressing the challenges of climate change and infrastructure needs) as more compelling, I think it will be difficult for the government to make the case for pursuing a lower debt-ratio target – one below what is already the envy of the world.

6. Should the Ontario Government Delay Fiscal Consolidation?

At first glance, it may seem appealing to apply fiscal policy at the provincial level, since from this vantage point monetary policy is fundamentally limited. Even when monetary policy is not constrained by the lower bound on nominal interest rates, it cannot be differentially applied across the country. The key point is that all provinces and territories are in the same currency union. So the most central question concerns whether or not provincial fiscal policy can substitute for monetary policy.

More particularly, is there a fiscal policy package that can have the same expansionary effect on the provincial level of economic activity as would

occur if there were an independent provincial currency and a depreciation of that currency? Farhi et al. (2012) have answered this question. Since a domestic currency depreciation stimulates spending on domestic output by making exports cheaper and imports more expensive, it should not be surprising to learn that the required revenue-neutral fiscal package is a combination of lower payroll taxes (to lower the costs of domestic producers) and higher sales taxes (to finance the payroll tax cut and to raise the relative price of imports).

Farhi et al. have advocated this "fiscal devaluation" policy package for countries that are struggling within the European Union. The Greeks, for example, are unable to run up their fiscal deficit any further, as a condition for receiving their bail-outs. And, with a traditional devaluation precluded by their being part of the eurozone, their only option for attacking high unemployment is the balanced-budget fiscal package just identified. If individual provinces in Canada are similarly constrained, this is the recommended policy. It is disappointing that Ontario, for example, is not following this advice. Instead, in the Spring 2014 *Budget*, payroll taxes are slated to increase (not decrease), there is no projected change in the sales tax, and the plan involves the deficit ratio rising (not falling) in both the current and the following year. The remaining issue is whether this reliance on a more traditional fiscal policy, applied at the provincial level, can be expected to be helpful.

The first consideration, discussed briefly in section 4 above, is the nature of the monetary policy environment of the entire country. With a flexible exchange rate (vis a vis the rest of the world) and interest rates above zero, there is complete exchange-rate-induced crowding out. This means that, whether an increase in government spending is introduced at the federal or provincial level, there is no net increase in overall Canadian demand. But this does not mean that there is no effect within the province that undertakes the initiative. This is because the appreciating domestic currency lowers demand throughout the country, while the primary effect of the increase in government spending is in the initiating province. As demonstrated in Scarth (1992), the result is a smaller effect (in the initiating province) than the full-country effect under a fixed exchange rate environment, but (perhaps more important) – the effect is a beggar-thy-neighbour outcome.

In a two-region model, the increase in economic activity in the one jurisdiction comes fully at the expense of the other jurisdiction (that endures a decrease in economic activity of the same magnitude). Thus, while regional fiscal policy "works" (from the local point of view only), it is not a constructive policy to have all regions trying in vain to win this zero-sum game. In short, conventional fiscal policy implemented at the provincial level when the overall country is following a flexible exchange rate policy is not recommended. Pursuing beggar-thy-neighbour outcomes is the opposite of policy coordination.

It is noteworthy that the "fiscal devaluation" policy suggested above also involves beggar-thy-neighbour effects. But in that case, the negative spillovers are largely dispersed across the rest of the world, not concentrated entirely on the other provinces within the same country.

What is the situation when the exchange rate with the rest of the world is fixed – either by deliberate policy, or *de facto* by there being similar fiscal initiatives pursued in the rest of the world or when the zero lower bound on interest rates is important? As discussed is section 4, fiscal policy has a lasting effect on demand in this setting, and this conclusion carries over to provincial initiatives.

But the size of the jurisdiction that conducts the fiscal policy is important. The idea is to stimulate increased spending on the "domestic" firms' products. The smaller is the region, the higher is the proportion of people's income that is spent on "imports." As a result, in a particularly small province, there are almost no subsequent "rounds" of new incomes spent domestically, so the multiplier is tiny – even with no crowding out effects. This consideration – the smaller the region, the higher is

the propensity to import – is a fundamental reason why it has been argued for decades (Oates 1968) that if fiscal policy is to be used, it should be at the federal government level.

Finally, it is important to realize that the issue of policy uncertainty (discussed in section 4) applies equally to provincial fiscal policy. In Ontario's case, the plan is to lower the deficit ratio over a five-year period, after initially letting it increase during the first two years of the plan. Essentially, this latter part of the plan is to be accomplished by having the program spending ratio decrease by 2 percentage points. While this is less drastic than what was involved when the federal government eliminated its deficit during the 1990s (cutting the program spending ratio by 5 percentage points), the federal government enjoyed the relative luxury of having the provinces on which they could download these cuts. The provinces had to feel the political pinch of cutting health, education and welfare funding. Ontario will not enjoy this same degree of freedom as it struggles to meet its intended spending cuts. Skepticism concerning this plan is accentuated when the start of the hard decisions is delayed. In short, policy uncertainty in Ontario may well be depressing economic activity.

This concern is heightened if attention is paid to a recent report (2012) issued by the Parliamentary Budget Office (PBO) which indicated that provincial government fiscal policy in Canada is not sustainable.

The PBO conducted two analyses, one for the federal government and the other for the provincial and territorial governments, taken together as a group. The PBO avoided making any assumption concerning what is the appropriate level for the long-run target debt ratio in either case. Instead, they asked what adjustment in the primary deficit (the excess of current program spending over net taxes collected) is needed today if the government's debt ratio in 75 years is to be the same as it is today, and if its projections concerning future values for the interest rate on government debt, the growth rate of GDP (the government's tax base), and the costs of financing ongoing programs (such as public pensions, employment insurance, and health care) were to take place. These projections are fed into the two government budget accounting identities that are explained in the accompanying box, working back from the future to the present, and the resulting necessary value for the primary deficit is compared to the government's current actual value of the primary deficit. If the former is smaller than the latter, fiscal policy is said to be not sustainable.

The PBO verdict was that the federal government's finances are sustainable since it could afford to increase its primary deficit by 1.3 percentage points of GDP and still be at the edge of sustainability. The verdict was opposite for the provinces and territories taken as a group. To be sustainable, this group of governments need to decrease their primary deficit by 1.9 percentage points of GDP.

While the exact estimate varied as the PBO considered both more and less optimistic sets of projections, their overall verdict of sustainability remained for the federal government. This was not the case for the lower-level governments. The required trimming of the primary deficit estimate varied between 1 and 3.4 percentage points as more and less optimistic assumptions were made in the simulations. Further, since more debt is accumulated if the sustainability measures are postponed, the estimated necessary cut in the primary deficit rises the longer fiscal consolidation is delayed. For the intermediate-case projection, the required primary deficit cut for the provinces rises from 1.9 percentage points of GDP to 2.2, 2.5, 3.3 and 4.6 percentage points if consolidation is delayed for 5, 10, 20 or 30 years, respectively.

It is interesting how the PBO estimates were fundamentally affected by the changes made by the federal government in 2011 – changes in the escalator arrangement for federal transfers to provinces to help fund healthcare expenses over the coming years. This devolution of the healthcare funding challenge to the provinces fundamentally changed the assessment of the federal government finances from unsustainable to sustainable. So

now the provinces are bearing all the risk in this regard. Given this risk, and given that fiscal policy multipliers are smaller at the provincial level, it is not a good idea for provincial governments to initiate intended-to-be-expansionary measures at this time. Take Ontario as an example. That government's deficit ratio is currently about 2 percent of GDP, and its plan has it achieving a balanced budget in 4 years. That 2-percentage-point reduction is right in the 1.9-to-2.2 range that the PBO has estimated as necessary to barely achieve sustainability for the provinces as a group. It would seem that Ontario simply cannot afford to be any more delayed in its consolidation plan.

Those who resist this conclusion, especially the Ontario government, maintain that the infrastructure deficit is just as important as the budget deficit. And it certainly is the case that standard analysis – applied to the private sector – calls for firms to expand their holdings of capital whenever the borrowing rate is less than the internal rate of return of the project.

Should not this decision rule apply to public-sector capital projects as well? Indeed, it should, but there is one important difference. For many infrastructure projects, if there is no toll or user fee, the benefits can be real and substantial but no revenue flow is generated for the government. So even if the borrowing costs are low, the budget deficit is likely to be increased if there is not some reduction in government operating expenses or some increase in tax rates.

I say "likely" to be increased, since there is a little wiggle room for the government. The budget identities that are described in the boxed insert indicate that as long as the average interest rate that applies to the entire stock of outstanding debt is less than the nominal GDP growth rate, the debt-to-GDP ratio can still decline if the excess of program spending over taxes is quite small.

But in Ontario's case, even this small opportunity is not available. The *Budget* tables indicate that the debt ratio is projected to increase for the next three fiscal years, despite the fact that the tax ratio is to exceed the spending ratio in all three years. So if new infrastructure projects are not postponed, and if the target debt-reduction path is not abandoned, there will have to be either additional expenditure cuts elsewhere in the budget or tax increases.

Concerning the latter, it is often stressed (for example, by Dahlby 2008) that the drop in private spending that emerges exceeds the increase in government spending (since all taxes distort economic decisions). What is not generally appreciated is that, even if taxes do not distort at all, the reduction in private consumption and investment exceeds the increase in government spending. The intuition behind this outcome is that the pressure for higher interest rates results in an increase in the province's level of foreign indebtedness, even if there is no increase in government debt. With the province's net payment outflows increasing, and its GNP-to-GDP ratio falling, its tax base shrinks, so that – to avoid a rising deficit – the government must raise the tax rate more than one-for-one with its program spending rate.[5]

My recommendation for slowing down fiscal consolidation – at the federal but not the provincial level – is similar to the policy advice issued recently by Dodge et al. (2014). They argue (page 8) that "governments should expand their investment in infrastructure while restraining growth in their operating expenditures .... With ... interest rates ... remaining relatively low for at least two years ... fiscal prudence does not require bringing the

5 For a specific model that verifies this conclusion, see Scarth (2014, 239.)

annual budget balance to zero almost immediately. … it is the right time to invest in infrastructure." The reason for my more guarded recommendation concerning Ontario is that I think that it is unclear what the government's explicit commitment is. By emphasizing its plan to keep the growth in program spending below that in GDP, it seems that the government's deficit-reduction strategy is to target the primary deficit, not the overall deficit. If so, conditions for the debt ratio to fall over time are more stringent than those identified by Dodge et al. I conclude that it would be prudent for Ontario to delay its important infrastructure program by a couple of years.

CONCLUSIONS

It is worth emphasizing that this *Commentary*'s modest suggestion for tempering unemployment has been reached after a balanced evaluation of the important arguments against using fiscal policy for stabilization purposes on an ongoing basis. As a result, the suggestion for slightly slower fiscal consolidation at the federal government level should not be rejected on the grounds that proponents of postponed consolidation are to be ignored since they always advocate postponing. At least this proponent does not do so. After all, we will emerge from the zero lower bound on nominal interest rates problem fairly soon, and then – as already emphasized – the case for the proposal made here will have evaporated. In addition, it is worth reiterating, that the other recommendation of the essay is that calls for postponing consolidation at the provincial level should be rejected.

Appendix A: Does Fiscal Policy Involve a Free Lunch?

In the main text of this essay, it has been assumed that an expansionary fiscal policy necessarily raises the government budget deficit, and so it does not involve a "free lunch." The purpose of this Appendix is to provide analysis that supports this presumption. While less technical than the available literature (for example, Erceg and Lindé 2010) it is assumed that readers of the Appendix have some experience with formal economic analysis.

Some left-leaning policy advisors claim that, in the short run, a rise in government spending can so increase economic activity (and therefore the tax base) that the deficit could go down, not up, as is usually presumed. We can address this issue by assuming that output is demand-determined in the short run and by focusing on the government budget constraint given earlier in the text. For this short-run analysis we can ignore the pre-existing interest payments term in the definition of the overall deficit. Using upper-case letters to denote the levels of the deficit, D, and program spending, G, (not their ratios to GDP, Y), we have: $D = G - tY$. Taking first differences, we have the expression that addresses the issue in dispute: $\Delta D/\Delta G = 1 - t(\Delta Y/\Delta G)$. A free lunch requires $\Delta D/\Delta G < 0$, and this is possible only if the government spending multiplier exceeds the inverse of the tax rate, t. We have noted that the biggest plausible value for the expenditure multiplier, $\Delta Y/\Delta G$, is 2, and a realistic value for the average citizen's marginal tax rate, t, is something like one third. These representative values do not satisfy the requirement for a rise in spending to be self-financing, so we reject this version of the free lunch possibility as not empirically relevant. This conclusion is especially relevant when we consider the federal and provincial governments separately. Provincial governments face even smaller multipliers, and both levels of government have tax rates that are well below the overall government sector estimate of one-third that was just referred to above.

Some right-leaning policy advisors maintain a similar belief in a fiscal free lunch, but their focus is on the long run. They believe that a cut in tax rates will so stimulate the willingness to work, save and invest that the long-run sustainable level of GDP (the tax base) will rise to such an extent that the tax rate cut will be self financing. To assess this version of the free-lunch possibility, we need to specify a supply-side model of output determination that focuses on firms' input-output relationship and the levels of labour, L, and capital, K, hired by firms. The following equations define the standard model (in particular, the one used by Mansoorian and Moshin 2004) to consider taxation. Capital depreciation, productivity growth and open-economy considerations are suppressed for simplicity, but I have confirmed that none of these simplifications affect the conclusion. Again, for simplicity, it is assumed that the government uses its tax revenue to make lump-sum transfers to households, so there is no program spending. As a result, in full equilibrium, all output, Y, is privately consumed.

Households maximize the discounted (at a constant rate of time preference q) present value of utility. Utility at each point in time is $(a \ln(1 - L) + (1 - a)\ln Y)$, where L (labour) is time spent working (so $(1 - L)$ is the consumption of leisure), and Y is the consumption of purchased goods. The full-equilibrium solution of this utility maximization problem yields two conditions. First, households set their ratio of consumed goods to leisure to be proportional to the after-tax wage, $w(1 - t)$. In other words, households obey the following rule: $(Y/(1 - L) = ((1 - a)/a)(w(1-t))$. The second requirement that needs to be satisfied to ensure they are maximizing utility is that households save (acquire capital) as long as the after-tax interest yield on that capital,

$r(1-t)$ exceeds their rate of impatience, q. In full equilibrium, diminishing returns ensures that this yield is pushed down to the point that it just equals the household rate of time preference. Hence, $r(1-t) = q$ is one of the equations of the model.

The firms' input-output function is $Y = K^b L^{1-b}$, where b is a fraction that denotes capital's share of national income. Profit maximization requires that firms hire both inputs, capital and labour, up to the point that each input's marginal product (as derived from the input-output function) equals the rent that must be paid to the households that own those factors. Hence the following optimal hiring rules are part of the model as well: $bY / K = r$ and $(1-b)Y / L = w$ The final equation defines the government's revenue as the tax rate times the tax base: $R = tY$.

By taking the total differential of the model's equations and substituting down to the expression of interest, we have

$(\Delta R / R) / \Delta t = (1/t) - [(1 + b(L/(1-L)))/(1-b)]$

We assess the free lunch proposition by asking whether plausible parameter values suggest if there is any possibility that this expression could be negative. Only three parameters require assumptions. Two of these, the tax rate and capital's income share, are surely close to one-third. In addition, since households spend about one-third of their discretionary time at work, we can take the $(L/(1-L))$ ratio to be one-half. These assumptions keep the key free-lunch assessment expression solidly positive, so standard analysis lends no support to the long-run version of the fiscal free-lunch proposition. Bruce and Turnovsky (1999) have shown that, even when the tax rate cut raises the ongoing growth rate of the economy, there is still no fiscal free lunch.

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